



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,020	03/02/2004	Takahiro Sunaga	50395-256	9742
7590 12/03/2004 McDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			EXAMINER PENG, CHARLIE YU	
			ART UNIT 2883	PAPER NUMBER

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/790,020

Applicant(s)

SUNAGA ET AL.

Examiner

Charlie Peng

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 is/are allowed.
- 6) ☒ Claim(s) 6 and 7 is/are rejected.
- 7) ☒ Claim(s) 2-5 and 8-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/2/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/16/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Specification***

1. The disclosure is objected to because of the following informalities: On page 14, line 6, "8d" should be changed to "13d".

Appropriate correction is required.

### ***Drawings***

2. Figure 6A and 6B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claims 2 and 4 are objected to due to the following minor informalities. The applicant first states "...half the number or more of *first coupling ports* P1i...", which leads one to believe that P1i is a *plurality of first coupling ports*. The applicant then contradicts this statement by defining P1i as "...a *first coupling port*..." Further, the

Art Unit: 2883

examiner believes the phrase – “i”th *fewest* one– or –“i”th *shortest* one–, etc, is what the applicant intends instead of “...“i”th *fewer* one...”, and it would have made the claims easier to understand. Appropriate correction or explanation is required.

4. Claim 8 is objected to because of the following informalities: applicant makes a contradictory statement by making claim 8 dependent upon “any one of claims 1 to 7” as well as “1, 4, and 7”. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 6 is rejected under 35 U.S.C. §102(e) as being anticipated by U.S.

Patent 6,587,610 to Ao. Ao teaches an optical switch (**10/Fig. 2**) with a plurality of input ports (**Inputs 1-16**) and a plurality of output ports (**Outputs 1-16**). Ao also teaches that the optical switch reduces optical loss (**Fig. 3**), with a difference of approximately 0.08dB between all possible optical paths (**1-256**).

6. Claim 7 is rejected under 35 U.S.C. §102(e) as being anticipated by U.S.

Patent 6,738,540 to Marom. Marom teaches a plurality of demultiplexers (370) each having one input port (350) and K output ports (Fig. 3B & Fig. 4) Marom also teaches a plurality of multiplexers (320) each having one output port (330) and K input ports. (Fig. 3A & Fig. 4). Here the examiner considers multiplexer a switch (or switching part) that takes multiple incoming links and “merges” them into one outgoing link. A demultiplexer

Art Unit: 2883

does the inverse function. The number of MUX or DEMUX scales proportionally to the need of total input lines (Column 3, lines 26 –35), and it can be K or K-1. Each DEMUX has K-1 optical fibers connecting its output ports to input ports of the MUX on the opposite side. In such an embodiment, a total of  $(K-1) \times (K-1)$  optical fibers connects each DEMUX to each DEMUX. Although Marom is silent on the coupling ports for all the input/output port, it is inherent to the functions of MUX or DEMUX that there exist coupling connections between each of the ports and the optical fibers. Marom is also silent on the optical loss difference between all possible optical paths, however, since all optical path are substantially identical (input port – DEMUX – output port – coupling port –optical fiber – coupling port – input port – MUX – output port) except for negligible difference in optical fiber lengths, the optical losses must be substantially equal.

### ***Allowable Subject Matter***

7. Claim 1 is allowed. The following is a statement of reasons for the indication of allowable subject matter. The applicant discloses an optical switch matrix consisting two sets of N switching parts, with each switching parts having either one input port or one output port and N coupling ports along with a plurality of optical switching elements. NXN optical fibers are used to connected the coupling ports between the two sets of switching parts wherein the differences between the maximum and the minimum optical switching elements in any optical paths are equal to or less than 4. Ao teaches a segmented optical switch using P input ports and X output ports and an array of reflecting mirrors for redirecting beams of light traveling from input ports to output ports.

Art Unit: 2883

However, Ao uses a freestanding structure without optical fibers as means of optical path, and the number of optical switching elements (mirrors) could vary by more than 4 on different optical paths. Marom does not teach using optical switching elements as sections of the switching parts. It is this examiner's opinion that the prior art, taken alone or in combination, does not render obvious the optical module disclosed in claim 1 to one having ordinary skill in the art.

8. Claims 4 and 5 are objected to but would be allowable insofar as the claims can be understood due to the objections above. The following is a statement of reasons for the indication of allowable subject matter. The applicant discloses an optical switch matrix consisting two sets of N switching parts, with each switching parts having either one input port or one output port and N coupling ports. Furthermore, NXN optical fibers are used to connect the coupling ports between the two sets of switching parts. Ao teaches a segmented optical switch using P input ports and X output ports and an array of reflecting mirrors for redirecting beams of light traveling from input ports to output ports. However, Ao uses a freestanding structure without optical fibers as means of optical path. Marom does not teach a variable optical path length arrangement between the first coupling ports and the second coupling ports. It is this examiner's opinion that the prior art, taken alone or in combination, does not render obvious the optical module disclosed in claim 1 to one having ordinary skill in the art.

9. Claims 2, 3, and 8-10 are objected (see Claim Objections) to but would be allowable by virtue of being dependent claims of an allowable claim 1.

***Conclusion***


10. Statement filed on 06/08/2004 and its contents, have all been considered and made of record (note the prior art documents submitted by applicant in the Information Disclosure attached copy of form PTO-1449). These documents also fail to disclose or suggest the limitations above.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charlie Peng whose telephone number is (571) 272-2177. The examiner can normally be reached on 8:30 am - 5 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charlie Peng  
[charlie.peng@uspto.gov](mailto:charlie.peng@uspto.gov)

  
Frank G. Font  
Supervisory Patent Examiner  
Technology Center 2800